



Optimized Fins for Convective Heat Transfer

FIELD OF THE INVENTION

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This invention pertains to the field of convective heat transfer.

BACKGROUND OF THE INVENTION

This patent application is a continuation of USSN 09/671,531 now patent
10 6,668,915.

In the field of convective heat transfer, there is in general a tradeoff between heat transfer and pumping power. Power to run a pump or fan to move the fluid involved in heat transfer is usually an expense associated with achieving heat transfer. This is especially of concern in heat exchangers in which the fluid on at
15 least one side is gas such as atmospheric air. Gas side heat exchange is characterized by a relatively small heat transfer coefficient and a relatively small volumetric heat capacity of the gas. Gas side heat exchange designs make up for these drawbacks with large heat transfer surface area and large volumetric flowrate of gas, which together can require a significant amount of power to move
20 the gas. Furthermore, simple fans are frequently inefficient at converting electrical power to gas motion. All of this is especially true when, as is usually the case, there are limitations on the overall space occupied by the heat exchanger. Applications include liquid-to-gas heat exchangers, gas-to-gas heat